

## **State Route 255**

### **Humboldt Bay Bridges Seismic Substructure Retrofit**

### **Environmental Assessment Finding of No Significant Impact**

**Humboldt Bay, County of Humboldt**

01-Hum-255-KP 0.3/3.1  
PM 0.2/1.9  
01 – 296701

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## General Information About This Document

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing to seismically retrofit the State Route 255 Humboldt Bay Bridges in the County of Humboldt. After comprehensive analysis, both agencies, in consultation with local, regional, State and Federal public agencies concluded that there is no substantial evidence that the proposed project would have a significant impact on the environment. Consequently Caltrans and the FHWA jointly prepared this document, an Environmental Assessment/Finding of No Significant Impact (EA/FONSI) in compliance with the National Environmental Policy Act (NEPA) regulations. Based on their special expertise in the proposed action, the U. S. Army Corps of Engineers, U. S. Coast Guard, National Marine Fisheries Service, and U. S. Fish and Wildlife Service participated as cooperating agencies in the preparation of this environmental document. The EA/FONSI describes why the project is being proposed, alternative methods for constructing the project, the existing environment that could be affected by the project, and potential impacts from each of the alternatives.

Prior to the final EA/FONSI, a draft EA/FONSI was approved and publicly circulated to provide an opportunity for review and comment on the project and the environmental documentation. A summary of the public review and comment process of the draft environmental document is contained in Appendix A of this document.

**Any additions or modifications to the draft document are marked with a vertical line in the margins in this final document.** Other than a new eelgrass mitigation plan, there are no substantial changes made to the draft document. (For more information regarding the mitigation plan, please refer to Chapter 3.)

The Humboldt Bay Bridges seismic retrofit project is statutorily exempt from the California Environmental Quality Act (CEQA). Section 180.2 of the California Streets and Highways Code stipulates that “the structural modification of an existing highway structure or toll bridge, or the replacement of a highway structure or toll bridge within, or immediately adjacent to, an existing right-of-way” are exempt from CEQA by considering them to be “specific actions necessary to prevent or mitigate an emergency”, a statutory exemption under Public Resources Code Section 21080(b)(4). However, compliance with other State laws and regulations as well as State resource agency permits will be required in order to construct this project.

After the environmental document process is completed, prior to construction, Caltrans would proceed to the final project engineering design and plan preparation stage and obtain any required public agency permits and acquire the needed construction easements to construct the project.

**For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Deborah Harmon, Caltrans, P. O. Box 3700, Eureka, CA 95502-3700, telephone: 707-445-6416, or use the California Relay Service TTY number, 707-445-6463.**

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## Earthquake Terminology

**Epicenter** is the exact location on the Earth's surface directly above the focus of an earthquake.

**Magnitude** is a measure of the strength of an earthquake or strain energy released by it, as determined by seismographic observations. This is a logarithmic value originally defined by Charles Richter (1935). An increase of one unit of magnitude (for example, from 4.6 to 5.6) represents a 10-fold increase in wave amplitude on a seismogram or approximately a 30-fold increase in the energy released. In other words, a magnitude 6.7 earthquake releases over 900 times (30 multiplied by 30) the energy of a 4.7 earthquake - or it takes about 900 magnitude 4.7 earthquakes to equal the energy released in a single 6.7 earthquake. The 1992 Cape Mendocino earthquake registered 7.2. The actual experience of earthquake shaking intensity would depend on the distance from the earthquake epicenter.

**Maximum credible earthquake (MCE)** is the largest earthquake reasonably capable of occurring based on current geological knowledge. The MCE in the Humboldt Bay region would be a 7.5 magnitude earthquake from the Little Salmon Fault. A major earthquake is an earthquake having a magnitude of 7 to 7.99 on the Richter scale.

**Surface rupture** is a seismic hazard that can adversely affect structures or other improvements located on the surface traces of active faults. Strong earthquakes can cause secondary seismically induced ground failures including liquefaction.

**Liquefaction** is a phenomenon in which loose, saturated, granular soils suddenly lose shear strength due to earthquake-induced shaking and a rapid rise in pore water pressure. Liquefaction can result in bearing failures and settlement. The liquefaction potential is high because of the depth of unconsolidated material within each of the three channels.

**Seismic** is a term relating to or caused by an earthquake.

**Tectonic Plate** is a portion of the Earth's crust that moves relative to other plates and is characterized by volcanic and seismic activity around its margin.

A **Tsunami** is a series of sea waves most commonly caused by earthquakes beneath the sea floor. In the open ocean, tsunami waves travel at speeds up to 600 miles per hour. As the waves enter shallow water, they may rise to several meters and can cause great loss of life and property damage when they come ashore.

## Bridge Terminology

The following terms are used in the exhibits and text descriptions of the proposed project. For visual examples of the terms, refer to the figure that follows this terminology list.

**Abutment (abbreviated abut)** – Land structure supporting bridge superstructure at either end of a bridge.

**Bent or column** - Vertical bridge structural support; on the general plans the bents follow a numbering convention starting with the southernmost abutment designated as bent number 1 preceded with the first letter of the specific bridge, e.g., M-4 would be the fourth bent from the south on Middle Channel Bridge.

**Channel** - Any navigable waterway by vessels or artificially improved or created so as to be navigable by vessels, including the structures and facilities created to facilitate navigation.

**Cofferdam** - A watertight temporary structure that prevents water from entering an enclosed area; the enclosed area can be pumped dry in order to work on expanding bridge footings and adding footing piles.

**Footing** - The enlarged foundation under a column or bent to spread the bridge weight and prevent settling; in the case of the Humboldt Bay Bridges, footings could be completely or partially above ground.

**Girder** - a large strong beam, often of steel, forming a supporting element in a framework.

**Mean Sea Level** - The mean elevation of daily ocean tides. Humboldt Bay is influenced by ocean tides and to a lesser degree, stream discharge.

**Pier** - Vertical bridge structural support in open water. A letter-number designation is used throughout this document when referring to specific piers; piers are designated by either E for Eureka Channel Bridge, M for Middle Channel Bridge, and S for Samoa Channel Bridge, followed by a number. For example, Pier E-5 refers to the fifth pier (from the south bridge abutment) of the Eureka Channel Bridge. Note that each bridge abutment is considered the first or last bridge pier in terms of the pier numbering designation.

**Pile** - A heavy pipe driven or cast into ground (or bay channel bottom) to anchor a bridge footing. Temporary piles will be installed for a temporary trestle bridge for heavy equipment access to the columns and footings at the Eureka Channel and Samoa Channel Bridges.

**Pile Cap** – A raised portion on the top mat of the footing on deep-water piers.

**Pile Cap Platform** – A temporary construction feature attached to new deep-water footing piles which provides a platform to construct enlarged pile caps.

**Seal Course** – Permanent concrete feature placed at bottom of footing piles and sheet piles are attached to the seal courses to isolate water from the work area; seal courses are used in situations where it is difficult to de-water because the bay bottom is too porous.

**Skirt** – Concrete pre-cast structure that attaches around deep water pier pile caps that protects the bridge footing piles and hides them from view during low tides.

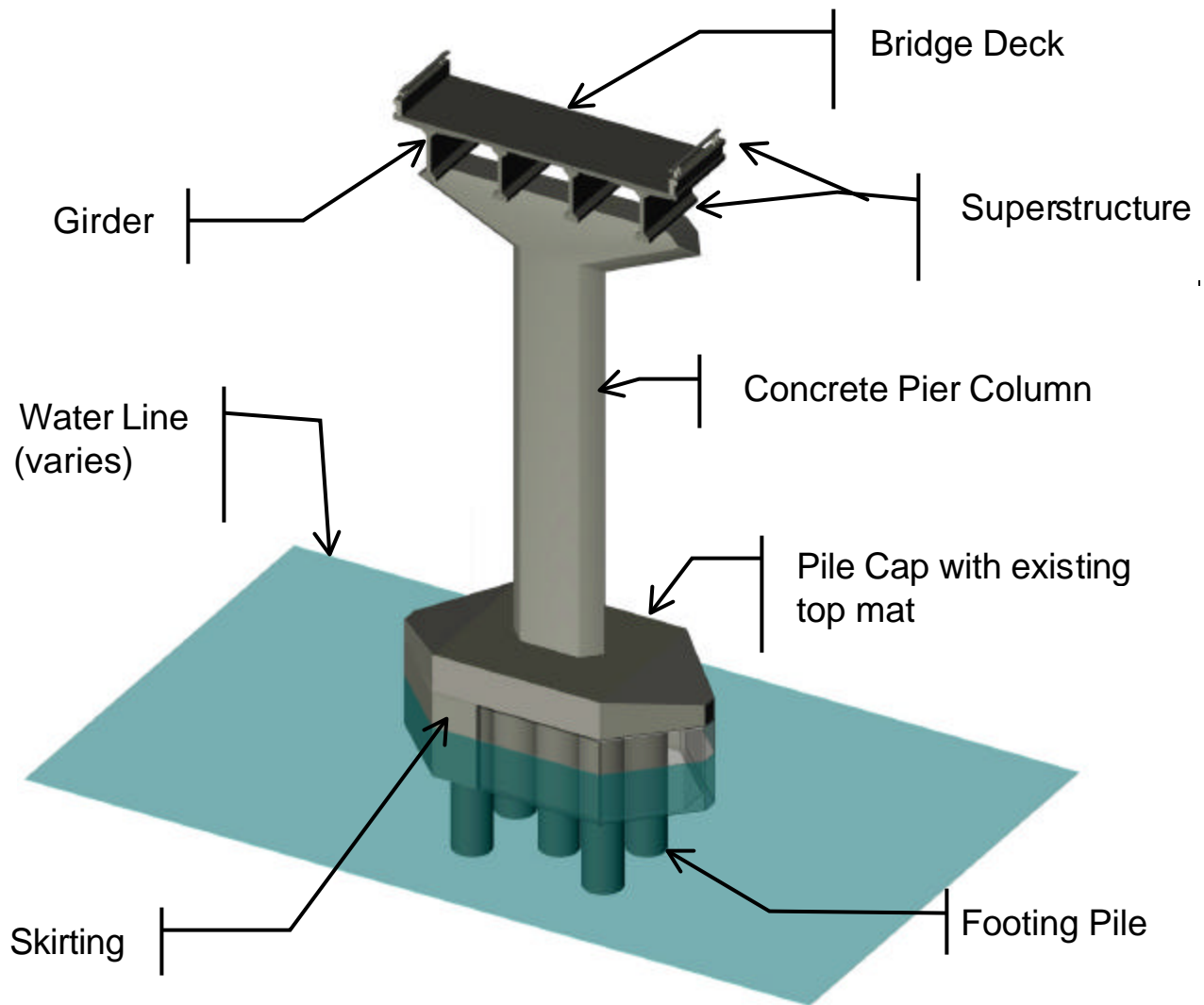
**Span** - Distance between bridge bents.

**Substructure** - That part of a bridge below the superstructure consisting of the columns, footings, footing piles, and shear keys.

**Superstructure** - That part of a bridge above the abutments and bents; i.e., the bridge deck, railing, girders, etc.

**Top Mat** – A vertical enlargement of the footing foundation starting from the top of the existing footing.





**Cross Section - Perspective  
Typical Existing Deep Water Bridge Pier**